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ARLEN L. OLSEN  
SCHMEISER, OLSEN & WATTS  
3 LEAR JET LANE  
SUITE 201  
LATHAM, NY 12110

EXAMINER

GOFF II, JOHN L

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 08/22/2002

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 09/781,730	Applicant(s) FARQUHAR ET AL.	
Examiner John L. Goff	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2001.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 22 (page 19, line 19 first mentioned). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 33, 41, 42, and 45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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5. Claim 33 recites the limitation "The device of claim 23" in line 1. There is insufficient antecedent basis for this limitation in the claim. It is suggested to change "The device of claim 23" to - - The method of claim 23 - -.
6. The term "about" in claim 41 is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear by how much below 120 °C or above 250 °C the lamination temperature can deviate. It is suggested to delete "about".
7. The term "about" in claim 42 is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear by how much below 100 PSI or above 700 PSI the lamination pressure can deviate. It is suggested to delete "about".
8. Claim 45 recites the limitation "the solvent" in line 4. There is insufficient antecedent basis for this limitation in the claim. It is suggested claim 45 depend from claim 35.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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10. Claims 23, 25, 26, 28, 29, 32, 34-36, and 40-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (U.S. Patent 4,747,897).

Johnson is directed to a method of bonding a dielectric material comprising polytetrafluoroethylene (PTFE) to a conductor such as a copper foil by impregnating the dielectric material with a thermosetting resin. Johnson teaches a dielectric material comprising a fluorocarbon such as PTFE and filler material such as ceramic, glass, metal, carbon, etc. (Column 3, lines 5-16). Johnson teaches a liquid thermosetting resin such as epoxy, polyimide, polyamide, etc. (Column 3, lines 3-5). Johnson teaches coating the dielectric material with the thermosetting resin (Column 6, lines 29-31). The coated dielectric material is heated to affect a B-stage cure (Column 4, lines 49-55 and Column 6, lines 32-34), and a resin impregnated dielectric sheet is formed. The sheet is then bonded between one or two sheets of copper foil (Column 4, lines 59-63 and Column 6, lines 47-53). The bonding occurs through the application of heat (175 °C) and pressure (100-800 PSI) (Column 7, lines 53-58 and Column 8, lines 7-10). The laminate can be fabricated into a single or double-sided printed circuit board (Column 4, lines 66-68). It is noted Johnson does not specifically recite a solvent included in the thermosetting resin. However, after coating the dielectric material with thermosetting resin Johnson performs a B-stage cure, thus the resin would inherently include a solvent.

11. Claims 23, 25, 26, 28, 29, 32, 34-37, 40, and 43-45 are further rejected under 35 U.S.C. 102(b) as being anticipated by Ueno et al. (U.S. Patent 4,765,860).

Ueno et al. are directed to a method for bonding a plastic base to a metal foil using a plastic resin to form a printed circuit board wherein the surface of the base is subjected to a plasma process to enhance the bonding strength between the base and the foil (Column 2, lines

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28-35 and 40-45). Ueno et al. teach a plastic base made of polyester, polyimide, or PTFE (Column 3, lines 14-18), and the base may include glass filler material (Column 3, lines 18-22). The base is subjected to a plasma discharge (Column 3, lines 23-28 and 33-37). A thermosetting adhesive with solvent is applied to the base, and the base is heated to remove the solvent (Column 5, lines 4-31). The base is then bonded to a metal foil, such as a copper foil, under pressure and at room temperature or an elevated temperature (Column 5, lines 23-31).

*Claim Rejections - 35 USC § 103*

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 24, 33, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson as applied above in paragraph 10, and further in view of the admitted prior art (Specification pages 1-3).

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Regarding claims 24 and 38, Johnson teaches all of the limitations in claims 24 and 38 as applied above except for a teaching on using nonfibrillated PTFE. However, the use of nonfibrillated PTFE as part of the dielectric material when forming a conductive laminate is known as shown by the admitted prior art. The admitted prior art (Specification pages 1-3) is directed to bonding a PTFE matrix to a conductive layer to form a laminated electrical substrate. The admitted prior art teaches using nonfibrillated PTFE. Absent any unexpected results, one of ordinary skill in the art at the time the invention was made reading Johnson in view of the admitted prior art would have readily used as the PTFE in the method shown by Johnson a nonfibrillated PTFE as taught by the admitted prior art.

Regarding claim 33, Johnson teaches all of the limitations in claim 33 except for a teaching on forming a chip carrier. As noted in the admitted prior art (Specification pages 1-3) it is known to form chip carriers using a PTFE matrix bonded to a conductive material, and one of ordinary skill in the art at the time the invention was made reading Johnson in view of the admitted prior art would have readily appreciated using the method suggest by Johnson to form a chip carrier as suggest by the admitted prior art as only the expected results would be achieved.

15. Claims 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson as applied above in paragraph 10, and further in view of Hanson (U.S. Patent 4,670,089).

Johnson teaches all of the limitations in claims 27 and 30 as applied above except for a teaching on providing the resin as a sheet or coating the conductor with resin. However, it is known in the art to apply the resin as a sheet or as a coating as shown by Hanson. Hanson is directed to a method of bonding a PTFE matrix to a metal substrate using a thermosetting

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adhesive layer. Hanson teaches a fluorocarbon film comprising PTFE and filler materials such as polyimide, glass, bronze, carbon, etc. (Column 1, lines 27-29 and Column 3, lines 3-6).

Hanson teaches that it was known to bond the film to a metal substrate using thermosetting adhesive wherein the adhesive is coated on the film by a brush (Column 1, lines 57-61) or the adhesive is in sheet form and placed between the film and metal prior to bonding by heat (at 190 °C) and pressure (Column 2, lines 3-7 and 30-55 and Column 3, lines 60 and Column 4, lines 33-35).

Regarding claim 27, it would have been obvious to one of ordinary skill in the art at the time the invention was made reading Johnson in view of Hanson to coat the conductor with adhesive prior to bonding as only the expected results would be achieved.

Regarding claim 30, it would have been obvious to one of ordinary skill in the art at the time the invention was made reading Johnson in view of Hanson to modify the bonding method taught by Johnson to incorporate the resin sheet suggested by Hanson as only the expected results would be achieved.

16. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson as applied above in paragraph 10, and further in view of Ueno et al. and Kusano et al. (U.S. Patent 5,425,832).

Johnson teaches all of the limitations in claim 37 as applied above except for a teaching on subjecting the PTFE matrix to a plasma process prior to coating. It is well known in the art when bonding a PTFE matrix to a conductive material to first subject the PTFE matrix to a plasma process to provide the PTFE matrix with a hydrophilic surface thereby enhancing adhesion between the PTFE matrix and the conductor as shown for example by Ueno et al. and

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Kusano et al. One of ordinary skill in the art at the time the invention was made reading Johnson in view of Ueno et al. and Kusano et al. would have readily appreciated modifying the method taught by Johnson to incorporate the well known plasma discharge technique shown for example by Ueno et al. and Kusano et al. to provide the PTFE matrix with a hydrophilic surface thus enhancing the adhesion between the PTFE matrix and the conductor.

As noted above Ueno et al. are directed to a method for bonding a plastic base to a metal foil using a plastic resin to form a printed circuit board wherein the surface of the base is subjected to a plasma process to enhance the bonding strength between the base and the foil (Column 2, lines 28-35 and 40-45). Ueno et al. teach a plastic base made of polyester, polyimide, or PTFE (Column 3, lines 14-18). The base is subjected to a plasma discharge (Column 3, lines 23-28 and 33-37). The base is bonded to a metal foil, such as a copper foil, using a thermosetting adhesive (Column 5, lines 4-22), and the bonding occurs under pressure and at room temperature or an elevated temperature (Column 5, lines 23-31). Kusano et al. are directed to bonding a fluoropolymer sheet to a substrate using an adhesive wherein the sheet is modified by plasma discharge treatment to provide a hydrophilic surface for improving adhesion between the sheet and substrate (Column 1, lines 30-33 and 42-44 and Column 2, lines 10-17). Kusano et al. teach a fluoropolymer sheet comprising PTFE (Column 3, lines 48-50). Kusano et al. teach subjecting the sheet to a plasma discharge to form a hydrophilic surface (Column 6, lines 12-17). Kusano et al. teach bonding the PTFE sheet to a copper foil using a thermosetting (epoxy) adhesive by well known means such as heating, pressing, and heat pressing (Column 6, lines 18-29 and 66-68 and Column 7, lines 1-3).

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17. Claims 31 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson as applied above in paragraph 10, and further in view of Kodokian (U.S. Patent 5,762,741).

Johnson teaches all of the limitations in claims 31 and 39 as applied above except for a teaching on the thermosetting resin including a contrasting dye and 30-75 percent solids.

Regarding claim 31, it is known in the art to use a thermosetting resin with filler material to bond a PTFE matrix to a conductor as shown for example by Kodokian. One of ordinary skill in the art at the time the invention was made reading Johnson in view of Kodokian would have readily understood using a thermosetting resin in the method taught by Johnson that includes filler materials which would have included dyes as suggested by Kodokian as only the expected results would be achieved.

Kodokian is directed to a method for bonding polymeric articles. Kodokian teaches heat and pressure bonding a polymer matrix, such as PTFE and filler material, to a composite layer comprising a conductive material, such as copper, using a thermosetting adhesive that comprises a thermoset and filler material (Column 3, lines 7-8, 11-13, 28-42, 56-58, and 63-67 and Column 7, lines 56-67 and Column 8, lines 1, 4-8, 19-23, 25-28, 66-67 and Column 9, 19-20).

Regarding claim 39, as noted above Johnson teaches a liquid thermosetting resin. Johnson is silent as to the percent solids in the resin. However, one of ordinary skill in the art at the time the invention was made would have readily understood that when using a liquid thermosetting resin as taught by Johnson the resin would have included less than 100% solids.

18. Claims 24, 33, and 38 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. as applied above in paragraph 11, and further in view of the admitted prior art (Specification pages 1-3).

Regarding claims 24 and 38, Ueno et al. teach all of the limitations in claims 24 and 38 as applied above except for a teaching on using nonfibrillated PTFE. However, the use of nonfibrillated PTFE as the dielectric material when forming a conductive laminate is known as shown by the admitted prior art. The admitted prior art (Specification pages 1-3) is directed to bonding a PTFE matrix to a conductive layer to form a laminated electrical substrate. The admitted prior art teaches using nonfibrillated PTFE. Absent any unexpected results, one of ordinary skill in the art at the time the invention was made reading Ueno et al. in view of the admitted prior art would have readily used as the PTFE in the method shown by Ueno et al. a nonfibrillated PTFE as taught by the admitted prior art.

Regarding claim 33, Ueno et al. teach all of the limitations in claim 33 except for a teaching on forming a chip carrier. As noted in the admitted prior art (Specification pages 1-3) it is known to form chip carriers using a PTFE matrix bonded to a conductive material, and one of ordinary skill in the art at the time the invention was made reading Ueno et al. in view of the admitted prior art would have readily appreciated using the method suggest by Ueno et al. to form a chip carrier as suggest by the admitted prior art as only the expected results would be achieved.

19. Claims 27 and 30 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. as applied above in paragraph 11, and further in view of Hanson (U.S. Patent 4,670,089).

Ueno et al. teach all of the limitations in claims 27 and 30 as applied above except for a teaching on providing the resin as a sheet or coating the conductor with resin. However, it is known in the art to apply the resin as a sheet or as a coating as shown by Hanson. Hanson is

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directed to a method of bonding a PTFE matrix to a metal substrate using a thermosetting adhesive layer. Hanson teaches a fluorocarbon film comprising PTFE and filler materials such as polyimide, glass, bronze, carbon, etc. (Column 1, lines 27-29 and Column 3, lines 3-6).

Hanson teaches that it was known to bond the film to a metal substrate using thermosetting adhesive wherein the adhesive is coated on the film by a brush (Column 1, lines 57-61) or the adhesive is in sheet form and placed between the film and metal prior to bonding by heat (at 190 °C) and pressure (Column 2, lines 3-7 and 30-55 and Column 3, lines 60 and Column 4, lines 33-35).

Regarding claim 27, it would have been obvious to one of ordinary skill in the art at the time the invention was made reading Ueno et al. in view of Hanson to coat the conductor with adhesive prior to bonding as only the expected results would be achieved.

Regarding claim 30, it would have been obvious to one of ordinary skill in the art at the time the invention was made reading Ueno et al. in view of Hanson to modify the bonding method taught by Ueno et al. to incorporate the resin sheet suggested by Hanson as only the expected results would be achieved.

20. Claims 31 and 39 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. as applied above in paragraph 11, and further in view of Kodokian (U.S. Patent 5,762,741).

Ueno et al. teach all of the limitations in claims 31 and 39 as applied above except for a teaching on the thermosetting resin including a contrasting dye and 30-75 percent solids.

Regarding claim 31, it is known in the art to use a thermosetting resin with filler material to bond a PTFE matrix to a conductor as shown for example by Kodokian. One of ordinary skill

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in the art at the time the invention was made reading Ueno et al. in view of Kodokian would have readily understood using a thermosetting resin in the method taught by Ueno et al. that includes filler materials which would have included dyes as suggested by Kodokian as only the expected results would be achieved.

Kodokian is directed to a method for bonding polymeric articles. Kodokian teaches heat and pressure bonding a polymer matrix, such as PTFE and filler material, to a composite layer comprising a conductive material, such as copper, using a thermosetting adhesive that comprises a thermoset and filler material (Column 3, lines 7-8, 11-13, 28-42, 56-58, and 63-67 and Column 7, lines 56-67 and Column 8, lines 1, 4-8, 19-23, 25-28, 66-67 and Column 9, 19-20).

Regarding claim 39, as noted above Ueno et al. teach an adhesive coating comprising a thermosetting resin and solvent. Ueno et al. are silent as to the percent solids in the coating. However, one of ordinary skill in the art at the time the invention was made would have readily understood that when using a coating comprising a thermosetting resin and solvent as taught by Ueno et al. the coating would have included less than 100% solids.

21. Claims 41 and 42 are further rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. as applied above in paragraph 11, and further in view of Johnson.

Ueno et al. teach all of the limitations in claims 41 and 42 as applied above except for a teaching as to the specific bonding temperatures and pressures. As shown above, Johnson is directed to a method of bonding a dielectric material comprising polytetrafluoroethylene (PTFE) to a conductor such as a copper foil by impregnating the dielectric material with a thermosetting resin. Johnson teaches that the bonding occurs through the application of heat (175 °C) and pressure (100-800 PSI) (Column 7, lines 53-58 and Column 8, lines 7-10). One of ordinary skill

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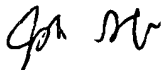
in the art at the time the invention was made reading Ueno et al. in view of Johnson would have readily understood performing the bonding method taught by Ueno et al. using the conditions suggested by Johnson as only the expected results would be achieved.

*Conclusion*

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John L. Goff** whose telephone number is **703-305-7481**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on 703-308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



John L. Goff  
August 19, 2002



Michael Ball  
Supervisory Patent Examiner  
Art Unit 1733